



The Safety Corner

From Marine Corps Center for Lessons Learned

February 2010



FEBRUARY 2010

Marine Corps Center for Lessons Learned
Safety Corner

Inside this issue:		Like Father, Like Son	5
Spinal Injuries Up Among Troops	1-2	MRAP Trends	6
IED Attacks on the Rise	2	Marine Corps Short Narratives	7
Back Safety	3	Navy Short Narratives	8
PPE Works...If Worn	4	Fatality Summary	9

Spinal Injuries Up Among Troops

[USA Today](#)



A U.S. soldier unloads 50-caliber rounds from an MRAP vehicle after an IED attack in Wardak province in Afghanistan.

Afghan insurgents are using roadside bombs powerful enough to throw the military's new 14-ton, blast-resistant vehicles into the air, increasing broken-back injuries among U.S. troops. Doctors at the U.S. military hospital here say more than 100 U.S. service members have suffered crushed or damaged spinal columns from being thrown around inside armored Mine Resistant Ambush Protected (MRAP) vehicles in the last five months.

This "significant increase" in spinal injuries was not seen in the Iraq war, says Air Force Col. Warren Dorlac, director of trauma care for both conflicts. One in five wounded service members evacuated from Afghanistan this summer and early fall suffered a spinal injury and at least 14 were left paralyzed or with loss of sensation, says Air Force Lt. Col. Dustin Zierold, a surgeon and the hospital's director of trauma care.

"Whatever the G-force (of the roadside bombs), it is very high and very destructive," Zierold says. Medical officials here are concerned about whether seating, harnesses and flooring in MRAPs adequately absorb the force of blasts, Zierold says. He says a doctor in Kandahar is trying to design a seat that would guard against spinal injuries.

More research is needed to improve seating and flooring designs, said Marine Brig. Gen. Michael Brogan, director of the Pentagon's MRAP program. "In future vehicles, that will be the key to survivability," he says. The MRAPs are the military's chief response to the No. 1 killer of U.S. troops in Iraq and now in Afghanistan: roadside bombs.

More than 3,500 of the \$1.4 million vehicles are in Afghanistan. Brogan said that insurgents are building larger bombs to overcome the MRAP's armor and the V-shaped hull, which carries the force of an explosion away from the center of the vehicle.

In Afghanistan, fewer paved roads make it easier for insurgents to bury large explosives that can launch these heavy vehicles several feet into the air, Army commanders and doctors say.

(continued)

Log onto the Marine Corps Center for Lessons learned Webpage.
NIPRNET <http://www.mccll.usmc.mil>
SIPRNET <https://www.mccll.usmc.mil>

[Subscribe to MCCLL Products](#)

Please add MCCLL Safety Corner to your

Director, MCCLL: C. H. Sonntag
Deputy Director: Operations: Major Joe Novario
Editor: William Richardson

[Do you have a safety story you'd like to share? We'd like to hear about it and inspire others.](#)

Spinal Injuries Up Among Troops continued

A lighter, all-terrain MRAP version arrived in Afghanistan last month with improved shock-absorbing seating and more complex harness designs, Brogan says.

Doctors here are gathering data matching spinal injuries with vehicle types, position of the occupant, surgical treatment that followed, incidence of paralysis and other factors. They are giving the data to engineers to help improve designs, Zierold says. Air Force Reserve Col. Paul Dwan, a neurosurgeon here, held up his forefinger and thumb in the shape of a flattened letter "C" illustrating how the service member's back is affected by the blast inside the MRAP. "They getting clammed up, they're getting scrunched down," Dwan says. Insurgents are "using bigger IEDs (improvised explosive devices). We're seeing the nature of the injuries change."

The back injury is "like bending a stick by pushing at both ends toward the middle," Zierold says. "The stick first bends, then will break." In addition to spinal injuries, physical damage often includes shattered bones in the feet and ankles, and a concussion from the servicemember's head hitting the MRAP ceiling, say Dwan and Zierold. In some cases, soldiers and Marines are being blown out of their harnesses by the blast.

Brogan says MRAPS have saved countless lives, but as bombs get bigger, unanticipated problems arise. He says that improved seating, harnesses and flooring can mitigate the bomb affect to some degree. But, "eventually armor loses. ... You can only build so much defense and eventually, with enough explosive, it can be overcome."



Did You Know?

Roadside bombs cause 75% of casualties to coalition forces in Afghanistan, up from 50% two years ago.

Source: [USA Today](#)

IED Attacks On the Rise

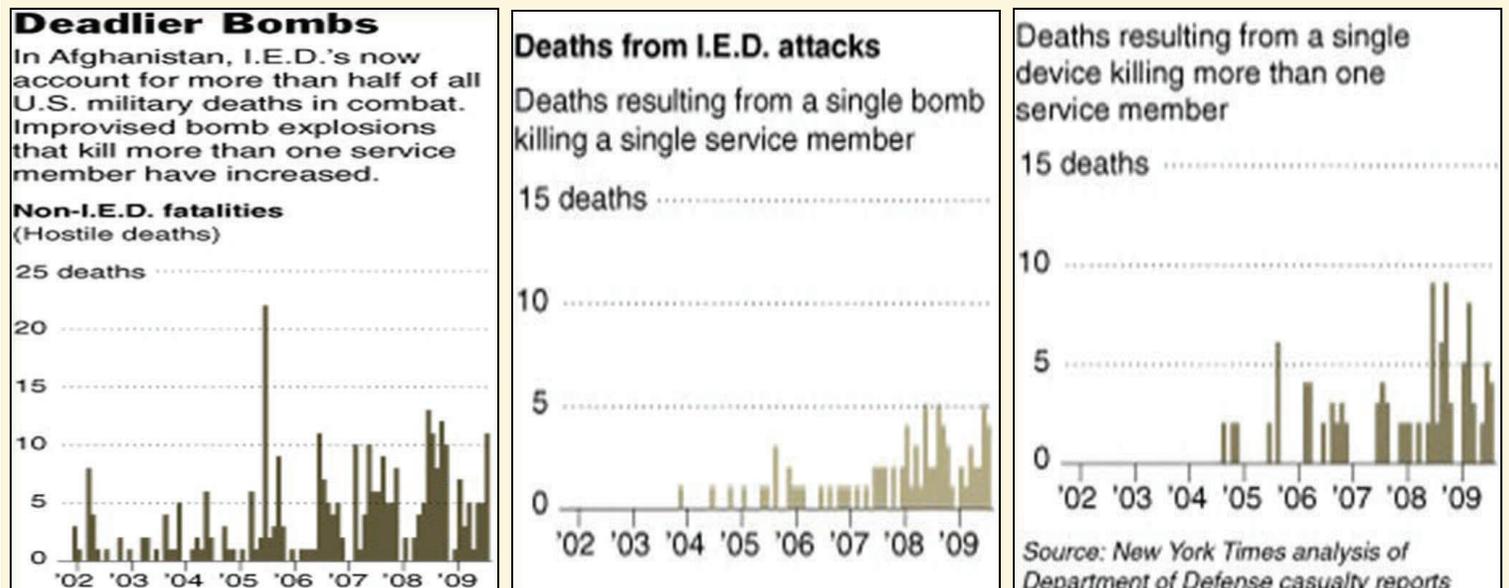
In Afghanistan today, death is measured not by the accuracy of bullets but by the cleverness of bombs. Although, the improvised explosive devices, or i.e.d.'s, are not as powerful or complex as those used in Iraq, they are becoming more common and more sophisticated everyday.

Bomb attacks have spiked to an all-time high, and with few paved roads, Afghanistan is even more fertile territory for i.e.d.'s. than Iraq. Even when i.e.d.'s do not wound or kill, the threat restricts and complicates the movements of forces, causing convoys to often have to wait for bomb-detection teams.

Safety Tips

When traveling on roads, no matter how familiar:

- ◆ Stay vigilant
- ◆ Keep your heads on a swivel
- ◆ Look for any abnormalities, subtle changes in the environment that may be signs of IEDs or insurgent activity
- ◆ Look for hidden IED's in brush or buried in the middle of a road
- ◆ Look for telltale signs that don't match what you expect to see
- ◆ Subscribe to MCCLL's Weekly TTP Rollup (**SIPR users Only**)



Back disorders are listed in the "top ten" leading workplace injuries published by the National Institute of Occupational Safety and Health. They account for 27 percent of all nonfatal injuries and illnesses involving days away from work. It's no wonder. Your back is a sophisticated piece of machinery made up of numerous muscles, bones, nerves, and supporting tissues. It's a machine you use every day, probably in ways you don't even notice.

Just like the finest machinery, your back requires proper care to keep it working. If it's not working right, you'll suffer. An injured back affects your ability to move your limbs, your hips, your neck, and your head. Injuries to the back can be very debilitating, causing a lot of pain, time away from work, and often requiring physical therapy or even surgery. Everyone whose job involves stressful lifting or awkward postures is at risk for a back injury.

Frequent causes of back pain:

- ◆ Standing or sitting too long, especially without changing position
- ◆ Lifting or carrying something that is too heavy and/or awkward
- ◆ Lifting things using an incorrect technique, with your back in the wrong position
- ◆ Sleeping in the wrong position or on a bad mattress

Several symptoms can warn you that your back is injured. See a doctor if you notice:

- ◆ Sore or stiff muscles
- ◆ Numbness
- ◆ Tingling or burning sensations
- ◆ Not being able to move your head, arms or legs as much as you used to

Here are some tips to keep your back in optimum condition:

While lifting:

- ◆ Don't bend over an object you are lifting. Bend your knees, squatting in front of the object to reach it.
- ◆ Lift the object slowly and carefully, using your leg and arm muscles to lift, not pulling with your back.
- ◆ Keep your head up and look straight ahead while making the lift.
- ◆ While lifting, keep the object as close to your body as possible.
- ◆ Keep abdominal muscles tight while making the lift.
- ◆ Use the same techniques when you put the object down.
- ◆ If the object is too big or too heavy to lift using these techniques, use mechanical assistance or get someone else to help.

When reaching for objects:

- ◆ Do not reach for an object unless you're sure you're strong enough to lift it.
- ◆ Use a step ladder to reach objects above shoulder height.
- ◆ Avoid awkward stretches while reaching. These stress your back and could cause you to lose your balance.
- ◆ Don't depend on structures to support you (e.g., a shelf support, a storage rack, etc.). These could easily give way if you pull or tug on them.

Exercise also plays an important role in keeping your back strong, healthy, and flexible. A properly exercised back is less likely to be injured. Your physician, corpsman, company medical personnel, or other health care provider can recommend the best exercises for you, taking into account your physical condition and the type of work you do.

Finally, a word about back belts. There's a lot of controversy about using back belts to control low back injuries in workers who don't have an existing injury. One thing that is agreed upon is that back belts should never be a substitute for a comprehensive back injury prevention program. If you do use a back belt, be aware that you may experience a false sense of security by wearing the belt. You may be tempted to lift loads you wouldn't otherwise lift. Remember, it's your back doing the work, not the belt!

Always be alert for situations that could cause a back injury. Be kind to your back. Don't take unnecessary chances. By following proper lifting and reaching techniques and exercising properly, you'll help keep back problems behind you!



Did You Know?

It has been estimated that between 30 and 60 percent of the U.S. population will experience some form of low back pain in any given year.



Most of the time, instructions are a firm base in which we can practice our operations safely. They do not account for every scenario. For example, we preflight aircraft according to NATOPS procedures. In the E-2, we inspect the hydraulic filters and reservoirs, as NATOPS prescribes. However, we have not preflighted our aircraft completely if we miss a hole in the fuselage just inches above the hydraulic reservoir.

Good headwork and technique involves inspecting the required items, as well as scanning the area around them. Good headwork and technique normally is acquired through training, practice, experience, and articles like this.

A Sailor in our squadron experienced a second-degree burn while on cruise in 2007. Required personal-protective equipment, better known as PPE, was worn during the incident. The following scenario is a summary of what happened. It

highlights the importance of thinking about what we are doing, the environment it is being done in, and its potential hazards. The incident involved burns to the hands and arms of a maintainer working on the flight deck.

The incident occurred when an airman was scrubbing the flight deck near a catapult. She was wearing gloves but had the sleeves of her flight-deck jersey rolled up to her elbows. What the airman did not consider was that the catapult tracks get very hot after early morning "no loads" and the raging heat of the Arabian Gulf sun. She slipped and fell on the tracks, incurring second degree burns to her forearm.

In this case, if the airman had had her sleeves rolled down, it likely would have lessened the severity of the burns. Outside of flight quarters, rolling sleeves down while scrubbing the flight deck might not be defined as a requirement anywhere. However, it certainly stands to reason that catapult tracks can get extremely hot, and you should be prepared when working near them.

Temperatures on the flight deck rise above 110 degrees during summer combat operations in the Arabian Gulf and Arabian Sea. It is tempting for many flight-deck personnel and aircrew to relax their PPE requirements because of the heat. However, we must make sure we add a dash of headwork to the full measure of flight-deck regulations to prevent injuries. All hands must wear proper PPE to make sure all tasks are completed safely.

As a baseline, PPE should be the minimum items required for the job. The environment always should be taken into account, as well. Headwork and technique often are missing from procedures. As leaders, we should look out for these issues, share our lessons learned as often as we can, and avoid incidents like this one.



USE ORM

Operational Risk Management

Is Your Primary Tool For

Assessing Hazards

Remember

- ◆ Be excited about safety
- ◆ Communicate the importance of safety
- ◆ Add demonstrations to your training
- ◆ Provide awards
- ◆ Change it up, keep your training fresh



Follow these tips and you can have a tremendous influence on safety in your unit.

The year was 1989,” began my dad (a captain in the Marine Corps). “I was Dash 2 in the second division of a six-plane flight of AV-8Bs somewhere over the San Bernardino Mountains in Southern California. The mission was complete, or so I thought. It had been a great training mission. Six instructors had gotten their once-a-year instructor tactical-proficiency-update flight at the end of a three-week detachment from VMAT-203.

“The flight had departed Yuma with a rare weapons load for instructors in a training squadron. We had four live Mk-83 Snake Eyes each. As the mission and weapons planner, I had spent a few long days working on the details. In addition to the fun of the mission, we also took a lot of satisfaction in knowing that, after a trip to a tanker then a long low-level VR route, our flight had delivered six AV-8s on-time and on-target in the R2507 N target complex, known as Chocolate Mountains.

“We had joined-up in two divisions of Vs in trail, one-mile spread, 10,000 feet AGL, 320 knots, and talking to SoCal approach for VFR monitors to RTB at NAS Miramar. The weather was clear, but we were flying into a setting sun. All the adrenalin produced from the challenges of the training portion of the mission had left my brain. After all, the mission was over. I could fly to Miramar and land in my sleep, right? Wrong. Approach control called no altitude, read-out traffic. Nobody in lead division saw any traffic, and my attention was somewhere else from where it should have been: in front of the jet.

Suddenly, I was looking at a rear aspect of a white, single-engine, high-wing, light civil aircraft at such close range that I had no reaction time. However, I managed to pass close above and behind him. No one else saw the light civil aircraft; I don’t think he saw me. The old saying that it’s not over until you are in the chocks was foremost on my mind the rest of that RTB.”

Little did I know the lessons dad learned from that mission would have an impact on a flight of my own 20 years later. I was Dash 2 copilot in the second section of a four-plane flight of CH-46Es, in practically the same location as my dad had been. We were on our way home to Camp Pendleton after a successful support mission in Twenty-nine Palms. The day had begun with an early Monday morning brief. We had a relatively simple, yet important mission: The lead section was to transport the assistant commandant of the Marine Corps to various training sites. My section supported a ground unit with reinforcements and provided resupply to numerous high-altitude outposts and retransmission sites around the Marine Corps air-ground combat center (MCAGCC), Twenty-nine Palms.

The plan had gone smoothly, and my section had an uneventful transit to Twenty-nine Palms. We landed on four different mountain sites throughout the day, and each one presented different challenges. After finding a spot for our Phrogs to land, we’d jump out, help the crew chiefs and Marines load or unload. We’d also do a quick, yet thorough, load computation to figure out how to spread out the Marines and gear. Then we’d do a map study of the route to be flown to the next checkpoint. After five hours, we were all ready to get home.

By the time I heard the lead section switch to Longrifle (Camp Pendleton’s range control), my attention was no longer on the flight. After all, I could fly from the Temecula Valley to Camp Pendleton in my sleep, right? Wrong. We were about three rotors from lead, 130 knots, and 3,500 feet MSL (minimum altitude over Temecula Valley). The weather was unlimited visibility, with clear skies, but we were headed west in the afternoon into the sun.

Just as I reduced collective to descend into Camp Pendleton airspace, a high-wing, white, civil aircraft (sounds familiar) seemingly appeared out of nowhere. Before I could pull collective to climb, the Cessna passed about 50 feet below us, going in the opposite direction. Between the four pilots and four crew chiefs in the section, none of us saw the traffic before it nearly was too late.

This brief incident has taught me the same thing my dad learned years ago: Fly the mission from chock to chock. In aviation, the situation can change from one second to the next. When you are dropping bombs in a Harrier, or landing on a small mountain top while high, hot and heavy in a Phrog, it’s easy to stay focused and be ready for anything. It’s the times between the exciting ones where human error is most prevalent. We must stay vigilant throughout the flight. Fatigue and complacency always seem to be two common traits in aviation mishaps, and they could have been a causal factor in my dad’s scenario, as well as my own. Learn from those who have gone before you.

Popular Places

MRAP Mishap Trends Nov 07 – Jan 10

558 recorded mishap events from multiple sources*

233 events (42%) involve some type of rollover/tip-over

- 121 - Fall initiated; occurred due to ledge, slope or ground surface collapse
- 50 - Maneuver initiated; swerving maneuver on flat ground or terrain
- 17 - Impact Initiated; hitting object caused rollover
- 45 - Unknown

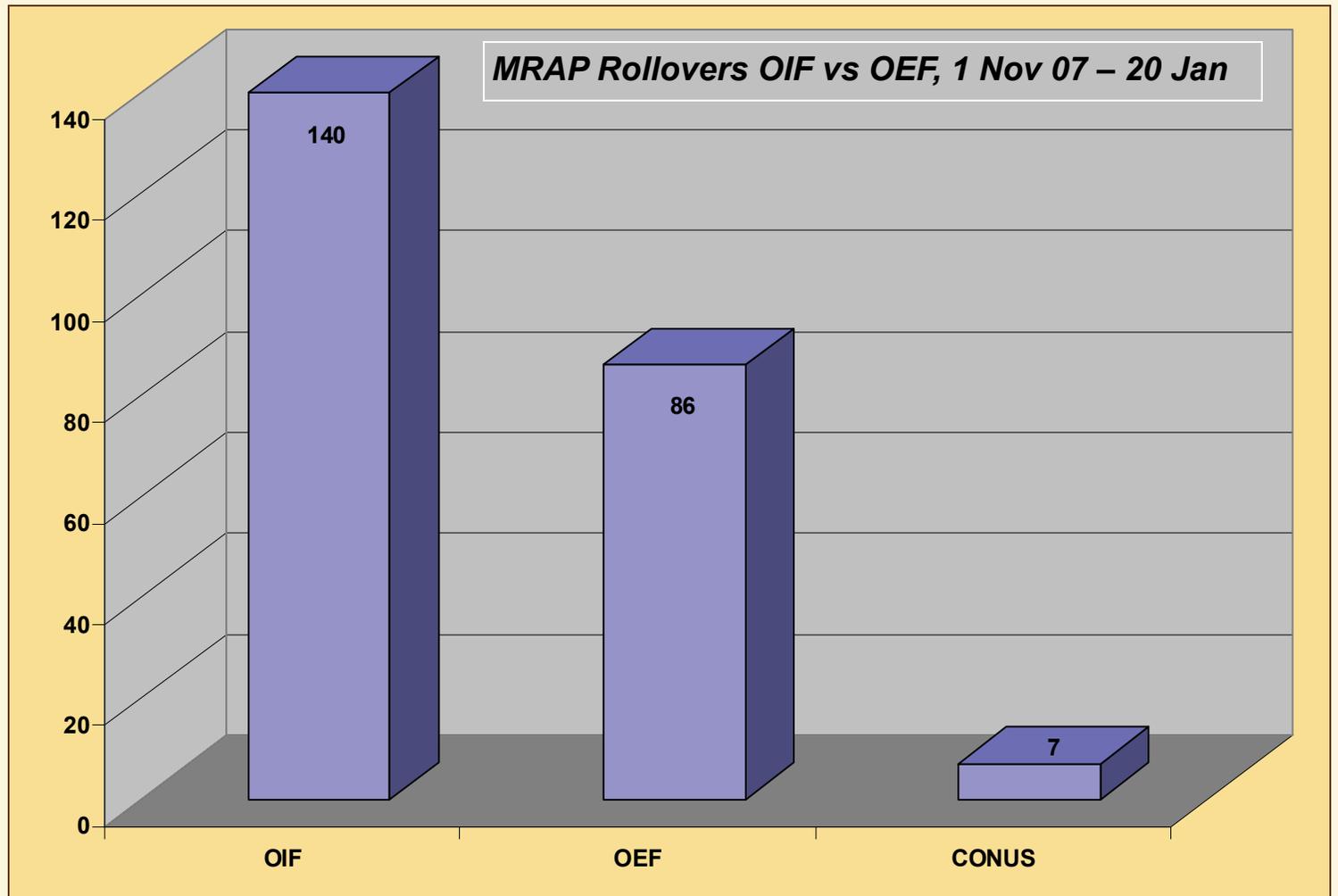
Nine rollover events have resulted in 13 fatalities; 7 drowning and 6 gunner blunt force trauma. The most recent occurred 16 Nov 09. To date there have been 267 reported rollover injuries.

Three Iraqi Security Forces (ISF) Iraqi Army (IA) received fatal injuries from MRAP mishaps. **Eighteen** other local nationals have received fatal injuries in ten accidents.

325 other mishap events include:

Event	Number
Traffic Accident with other vehicles	88
Personal Injury – Slips/Trips/Falls	37
Personal Injury – Crushing/laceration/blunt force (doors, hatches, Rhino, etc)	91
Power Line Related	18
Fire	33
Other, i.e. terrain impact, hit objects, failed to set parking brake, etc.	58

*CENTCOM SIGACTS, Unit Safety Gram/Red-Hash, Safety Centers. Data includes CONUS, OIF and OEF.



USMC AVIATION CLASS A MISHAPS

29 Oct 09 (California) AH-1W crashed into water after midair collision. (2 Fatalities)

26 Oct 09 (Afghanistan) AH-1 and UH-1 crashed in open desert. (4 Fatalities)

USMC GROUND CLASS A

22 Dec 2009: (Afghanistan) LCpl died while performing maintenance on a M88 when hoist chain broke causing vehicle to fall.

03 Dec 09 (Camp Pendleton, CA) Cpl died when parachute failed to open while conducting low level static line jump.

USMC OPERATIONAL MOTOR VEHICLE

04 Nov 09 (Camp Pendleton, CA) LCpl died in automobile mishap when his POV was hit by HMMWV.

USMC PRIVATE MOTOR VEHICLE FATALITIES

05 Jan 10 (Camp Lejeune, NC) PFC died in a single vehicle mishap.

27 Dec 09 (Westport, CT) SVM was passenger in auto that lost control/struck tree.

18 Dec 09 (San Diego, CA) Cpl died after being struck by an automobile in a hit and run mishap.

08 Dec 09 (Kailua, HI) Sgt died in a motorcycle mishap.

26 Nov 09 (Morongo Valley, CA) LCpl died when the vehicle in which he was a passenger overturned several times. Two other SVMs were hospitalized.

14 Nov 09 (New Brunswick, NJ) SSgt died 23 Nov 2009 from injuries sustained as a passenger in an automobile mishap.

06 Nov 09 (San Diego, CA) Sgt died in a motorcycle mishap when he collided with another vehicle.

27 Oct 09 (New Bern, NC) PFC died 03 Nov from injuries sustained in automobile mishap when vehicle rolled and struck a tree.

17 Oct 09 (Murrieta, CA) SSgt died in a motorcycle mishap when he collided with a vehicle that pulled out into his lane of travel.

13 Oct 09 (Santa Clara, CA) Sgt died in a multiple vehicle mishap.

09 Oct 09 (Escondido, CA) LCpl was in a minor two vehicle mishap and was being treated by emergency medical personnel at the scene when he was struck and killed by a third vehicle.

01 Oct 09 (New Bern, NC) PFC died in an automobile mishap after he struck the back of a school bus that was stopped at a railroad crossing.

USMC OFF-DUTY/RECREATIONAL FATALITIES

24 Dec 09 (Monroe, NY) Marine vomited in his sleep, did not wake up and died of asphyxiation.

09 Dec 09 (Albuquerque, NM) PFC was found deceased in private residence.

06 Dec 09 (Havelock, NC) Cpl died from a gunshot wound to the chest.

USN AVIATION CLASS A MISHAPS

28 Oct 2009: (Corpus Christi, TX) T-34C did not return from VFR training flight. (2 Fatalities)

USN SHORE CLASS A MISHAPS

03 Dec 09 (Portsmouth, VA) Civilian employee died after falling from roof of building.

USN PHYSICAL TRAINING CLASS A MISHAPS

05 Dec 09 PO3 died after fall from treadmill.

14 Oct 09 (Norfolk, VA) PO1 died while participating in command departmental PT.

USN PRIVATE MOTOR VEHICLE FATALITIES

03 Jan 10 (Chicago, IL) Seaman died in automobile mishap.

26 Dec 09 (Fresno County, CA) SVM S-bound on interstate in heavy rain, lost control of auto.

28 Nov 09 (James City County, VA) SA died in an automobile mishap. Two other SVMs sustained non life-threatening injuries.

14 Nov 09 (Pensacola, FL) MCPO died in a motorcycle mishap when he was struck head-on by a drunk driver.

16 Oct 09 (San Diego, CA) CDR died 25 days after being hit by a truck while riding his bicycle.

13 Oct 09 (Chesapeake, VA) PO2 died in a motorcycle mishap. PO2 on second motorcycle is in critical condition.

11 Oct 09 (Oahu, HI) PO2 died in a motorcycle mishap when he lost control and collided with oncoming traffic.

05 Oct 09 (Holden, MA) PO3 died in a single motorcycle mishap when he struck a tree.

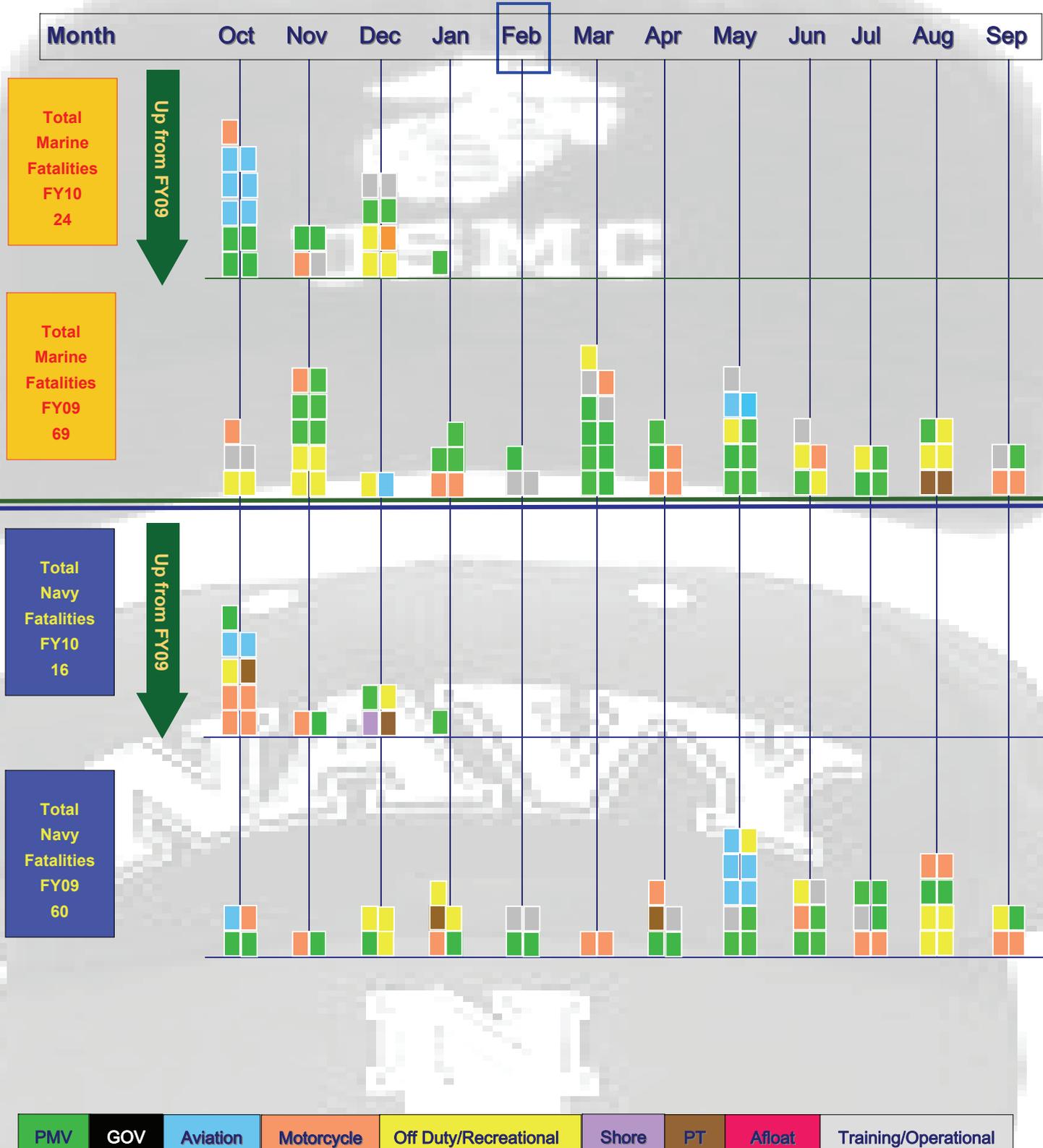
01 Oct 09 (Chocowintiny, NC) PO2 died in a motorcycle mishap when he lost control and then struck an oncoming vehicle.

USN OFF-DUTY/RECREATIONAL FATALITIES

09 Dec 09 (Norfolk, VA) PO3 died in an off-duty ATV mishap.

12 Oct 09 (Wahiawa, HI) PO2 died in a recreational parachuting mishap when his primary and reserve parachutes failed to open.

Fatality Summary as of February FY10



Note: This report has been compiled from publicly available information and is not official USMC policy. Although information has been gathered from reliable sources the currency and completeness of the information reported herein is subject to change and cannot be guaranteed.